[10191/1227]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

Applicants	:	Ulrich BENZLER et al.
Serial No.	:	09/462,863
Filed	:	May 8, 2000
For	:	METHOD FOR GENERATING AN IMPROVED IMAGE SIGNAL WHEN ESTIMATING THE MOTION OF IMAGE SEQUENCES, IN PARTICULAR A PREDICTION SIGNAL FOR VIDEO IMAGES USING MOTION-COMPENSATING PREDICTION
Examiner	:	Shawn AN
Art Unit	:	2613
Conf. No.	:	5597

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Date: August 20, 2003 Reg. No. 36,197

Signature: Jong H. Lee

APPELLANTS' APPEAL BRIEF
UNDER 37 C.F.R. § 1.192

S I R :

On July 14, 2003, Applicants filed a Notice of Appeal from the decision of the Examiner in the final Office Action mailed on March 12, 2003, which Office Action included final rejections of claims 6-12 of the above-identified application. This Brief is submitted by Applicants in support of their appeal.

I. REAL PARTY IN INTEREST

The above-identified Applicants and Robert Bosch GmbH of Stuttgart, Germany, are the real parties in interest.

II. RELATED APPEALS AND INTERFERENCES

No appeal or interference which will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, is known to exist to the undersigned attorney or is believed by the undersigned attorney to be known to exist to Applicants.

III. STATUS OF CLAIMS

Claims 6-12 are pending in this application. Applicants appealed from the final rejection of claims 6-12 made in the final Office Action mailed by the Patent Office on March 12, 2003. Of the claims presently on appeal, claim 6 is independent. Claims 7-12 ultimately depend from claim 6. The claims on appeal are set forth in the Appendix submitted herewith.

IV. STATUS OF AMENDMENTS

No amendment has been submitted subsequent the final Office Action mailed on March 12, 2003.

V. SUMMARY OF THE INVENTION

The present invention relates to a method for generating an improved image signal when estimating the motion of image sequences. In accordance with the present invention, motion vectors are formed for picture blocks, the motion vectors, for each picture block of a current image, indicating the position of the picture block used for the prediction with respect to a chronologically preceding reference image. (P. 3, l. 33 - p. 4, l. 4).

The motion vectors for the prediction are determined in three successive steps, as described in further detail below. In a first search step, a

motion vector is determined for each picture block with pel accuracy in accordance with a conventional method, for example, in accordance with the full-search block matching method. (P. 4, l. 8-11). In this context, the minimum error criterion is determined for possible motion positions, and the vector which best describes the motion of the picture block is selected. (P. 4, l. 11-14).

In a second search step, which, again, is based on such a search for the minimum error criterion, an improved motion vector is ascertained with sub-pel accuracy, starting out from the motion vector ascertained in the first step, using an aliasing-reducing interpolation filtering, with the aid of a digital, symmetric FIR (finite impulse response) filter. (P. 4, l. 17-23). In the second search step, a higher resolution is selected than in the first search step, e.g., one selects a resolution of a half pixel relative to the pixel raster. (P. 4, l. 23-25). Figure 2 illustrates the interpolation pattern for pixels b, c, and d between the pixel raster, as derived from the neighboring pixels A, B, C, D, E, F, G, H on the pixel raster. (P. 4, l. 26-29). In the following relationships, + indicates the integer-pixel position, O the half-pixel position, so that:

$$b = (CO1x(A_{-1} + A_{+1}) + CO2x\,(A_{-2} + A_{+2}) + CO3x\,(A_{-3} + A_{+3}) + CO4x\,(A_{-4} + A_{+4}))/256$$
$$c_i = (CO1x(A_i + E_i) + CO2x(B_i + F_i) + CO3x\,(C_i + G_i) + GO4x(D_i + H_i))/256$$
$$d = (CO1x(c_{-1} + c_{+1}) + CO2x(c_{-2} + c_{+2}) + CO3x\,(c_{-3} + c_{+3}) + CO4x(c_{-4} + c_{+4}))/256$$

(P. 4, l. 29 - p. 5, l. 4).

The structure of the FIR interpolation filter used is illustrated in Figure 3. Following each pixel position δp, it branches to a coefficient evaluator 1, 2, 3, etc., and has a summing device 10 at the output. (P. 5, l. 7-9). As is apparent from the above relationships, a greater local neighborhood is considered when generating pixels between the scanning raster, than in the case of the bilinear interpolation according to the related art. (P. 5, l. 9-13). In this context, the interpolation filter coefficients CO2, CO3, CO4 are determined in a way that

minimizes the interpolation error performance. (P. 5, l. 13-16). The coefficients can be determined directly using the known estimation method of the least root-mean-square error. (P. 5, l. 16-18). From the minimization of the interpolation error performance, one obtains a linear system of equations, whose coefficients can be derived from the principle of orthogonality. (P. 5, l. 18-21). A set of FIR filter coefficients optimized in this manner is given by the coefficients CO1 = 161/256, CO2 = -43/256, CO3 = 23/256, CO4 = -8/256. (P. 5, l. 21-23).

In the third search step, starting from the motion vector determined with an accuracy of ½ pel, a local search is performed using a further interpolation filtering, taking the eight neighboring pixels as a basis, with resolution that is increased still further, preferably to ¼ pixel. (P. 5, l. 25-29). As before, one selects the motion vector having the lowest prediction error performance. (P. 5, l. 29-31). Figure 4 shows the interpolation pattern for this third search step. The integer pixel positions are marked by X, the half-pixel positions by O, and the quarter-pixel positions by -. (P. 5, l. 33 - p. 6, l. 2). O indicates the best compensation with ½ pixel, and + the quarter-pixel search position. (P. 6, l. 3-4). The interpolation is carried out relative to the pixel raster, with a half-pixel resolution from the second search step, using filter coefficients CO1' = ½, CO2' = O, CO3' = O, CO4' = O. (P. 6, l. 6-9).

The same previously introduced interpolation technique is used for the motion-compensating prediction. (P. 6, l. 11-12).

If the processing is carried out within a coder having a reduced image format (SIF format within an MPEG1 coder or Q-CIF in an H.263 coder), but the original input format is used for the display, for example, CCIR 601[1] in the case of MPEG-1 or CIF in the case of H.263, a local interpolation filtering must be carried out as a post-processing. (P. 6, l. 14-19). The described aliasing-compensating interpolation filtering can be used for this purpose as well. (P. 6, l.

19-21). To activate the aliasing-compensating interpolation using 1/4 resolution, activation bits can be inserted into an image-transmission bit stream. (P. 6, l. 23-25).

To predict video objects, filter coefficients CO1 through CO4, and CO1' through CO4' can be separately conditioned for each of the video objects VO, and inserted into the image-transmission bit stream at the beginning of transmission of the video object in question. (P. 6, l. 27-31). For the encoding of a motion vector, the range of values of the motion vector differences to be coded can be adapted to the increased resolution. (P. 6, l. 33 - p. 7, l. 2).

By applying the measures of the present invention, one can improve the quality of the prediction signal and, thus, the coding efficiency. (P. 2, l. 25-27). In so doing, a greater local neighborhood is considered than in the case of bilinear interpolation, to generate pixels between the pixel scanning raster. (P. 2, l. 27-29). The aliasing-reducing interpolation filtering according to the present invention leads to an increased resolution of the motion vector and, consequently, to a prediction gain and an increased coding efficiency. (P. 2, l. 29-33). In the present invention, the FIR filter coefficients can be adapted to the signals to be coded, and be transmitted separately for each video object, thereby further increasing coding efficiency and enhancing the flexibility of the method. (P. 3, l. 33 - p. 4, l. 4).

VI. <u>ISSUES FOR REVIEW</u>

The following issues are presented for review on appeal in this case:

A) Whether the subject matter of claims 6-10 and 12 is rendered obvious under 35 U.S.C. § 103(a) by "Hierarchical Motion Estimation Using The Phase Correlation Method In 140 Mbit/s HDTV-Coding" by Manfred Ziegler ("the Ziegler reference") in view of United States Patent No. 4,880,160 to Thomas ("the Thomas reference").

B) Whether the subject matter of claim 11 is rendered obvious under 35 U.S.C. § 103(a) by the Ziegler reference and the Thomas reference in view of United States Patent No. 5,991,447 to Eifrig et al. ("the Eifrig reference").

VII. GROUPING OF CLAIMS

For purposes of this appeal, claims 6-10 and 12 will be argued as one group, and claim 11 will be argued separately.

VIII. ARGUMENTS

A. Claims 6-10 and 12

Claims 6-10 and 12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over "Hierarchical Motion Estimation Using The Phase Correlation Method In 140 Mbit/s HDTV-Coding" by Manfred Ziegler ("the Ziegler reference") in view of United States Patent No. 4,890,160 to Thomas ("the Thomas reference").

Independent Claim 6 recites:

A method for generating an image signal when estimating a motion of image sequences, motion vectors indicating, for each picture block of a current image, a position of the picture block used for a prediction with respect to a chronologically preceding reference image, the motion vectors being formed for each picture block, the method comprising the steps of:

in a first search step, determining a first motion vector with a pel accuracy;

starting out from the first motion vector, in a second search step, determining a second motion vector with a sub-pel accuracy by an aliasing-reducing interpolation filtering, using a digital filter, a resolution being selected to be higher than that corresponding to a resolution of a pixel raster in the first search step, **more than four neighboring pixels being utilized for an interpolation of each pixel**, to interpolate pixels between a scanning raster for the first search step; and

in a third search step, starting from the second motion vector,

determining a third motion vector by a further interpolation filtering using the digital filter, a resolution being increased once more in comparison with the second search step, an interpolation being carried out on the basis of a pixel raster, with a resolution in the second search step.

In rejecting a claim under 35 U.S.C. § 103(a), the Examiner bears the initial burden of presenting a prima facie case of obviousness. In re Rijckaert, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish prima facie obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). In addition, generalized assertions that it would have been obvious to modify the reference teachings do not properly support a § 103 rejection. See In re Jones, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992). Furthermore, even if a claim concerns a "technologically simple concept," there still must be some finding as to the "specific understanding or principle within the knowledge of a skilled artisan" that would motivate a person having no knowledge of the claimed subject matter to "make the combination in the manner claimed." In re Kotzab, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000).

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221

USPQ 1125 (Fed. Cir. 1984). If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959); MPEP 2143.01.

As acknowledged by the Examiner in the final Office Action, the Ziegler reference does not disclose at least "determining a second motion vector with a sub-pel accuracy by an aliasing-reducing interpolation filtering," with "**more than four neighboring pixels** being utilized for an interpolation of each pixel," as recited in Claim 6. In order to supplement this deficiency of the Ziegler reference, the Examiner cites col. 9, lines 25-55 of the Thomas reference as teaching a "motion vector detecting method comprising aliasing reducing interpolation filtering, and more than four neighboring pixels being utilized for an interpolation of each pixel in order to reduce visual effects of aliasing." (Final Office Action, p. 2). However, this assertion is clearly contradicted by not only the explicit teachings of Thomas, but also by subsequent assertions made by the Examiner following the Final Office Action.

The interpolation algorithm disclosed by the Thomas reference specifically teaches **"taking a weighted sum of the values of the four nearest pixels**," where "[t]he weights were chosen such that when the point being interpolated coincided with the location of either of the four pixels, the interpolated value was equal to the value of that pixel." (Thomas, col. 9, ll. 44-48, *emphasis added*). Thus, while the Thomas reference explicitly teaches **using four nearest pixels**, the Thomas reference clearly does not teach using **more than four neighboring pixels** for an interpolation of each pixel, as recited in Claim 6. In fact, the Examiner implicitly concedes this point in the Advisory Action of June 17, 2003, by noting that "weight is utilized for the interpolation of each pixel, wherein the weight is referred to as **weighted sum of the values of the four nearest**

pixels (Thomas; col. 9, lines 44-49).

Since the Ziegler and the Thomas reference do not disclose using **more than four neighboring pixels** for an interpolation of each pixel, as recited in Claim 6, the combination of Ziegler and Thomas references cannot render Claim 6 or its dependent Claims 7-10 and 12 obvious under 35 U.S.C. §103(a).

Independent of the above, Applicants note that there is no suggestion or motivation to be found in the disclosure of the Ziegler and Thomas references, or in the knowledge generally available to one of ordinary skill in the art, to modify the Ziegler reference as asserted by the Examiner to achieve the subject matter of Claim 6. Initially, it should be noted that the Ziegler reference teaches away from the subject matter of Claim 6. According to the Ziegler reference:

> [T]here are two principle procedures which allow to get vectors with subpixel accuracy: a nonlinear interpolation of the correlation surface function or a special kind of block-matching which takes the calculated motion vectors with pixel accuracy and refines them (Fig. 3). (Ziegler, §4.1).

The Ziegler reference also describes several disadvantages of nonlinear interpolation, including the necessity to inspect a significantly greater number of candidate vectors than with bilinear interpolation, and the necessity to fix the accuracy at the moment the computation starts. (Ziegler, §4.2). The Ziegler reference further states:

> **To avoid the disadvantages of an nonlinear interpolation, it is better to use another method.** Proceeding on the assumption that the motion vectors are already calculated as described in section 3, it is useful to refine these vectors. A very promising method is blockmatching using N steps and reducing the step-range to $1/2^N$ this way. (Ziegler, §4.3, *emphasis added*).
>
> The advantages of this procedure compared to a nonlinear interpolation are quite obvious. First it is possible to decide whether an accuracy of $½^N$ is enough, or whether it should be

> refined to ½ $^{N+1}$. So the accuracy may be dependent on a measurement of the obtained quality . . . . The second advantage is that the quality from one step to the next one remains equal in the worst case or increases, but never gets worse. That is not supposed in a nonlinear interpolation system, as shown in section 4.2. (Ziegler, §4.3).

Thus, Ziegler directly teaches away from using the techniques of a nonlinear interpolation system. Additionally, employing techniques of such a system would **introduce disadvantages that Ziegler attempts to eliminate**. Furthermore, according to Ziegler, such techniques may reduce the quality of its system.

The Thomas reference discloses a system to derive a correlation surface by phase-correlating two pictures using a nonlinear interpolation. (Abstract; col. 9, l. 1 - col. 13, l. 12). The Thomas reference identifies errors with its system, including:

> [T]he motion vector of parts of the gate are sometimes assigned incorrectly (despite the fiddle factor described earlier), and the spatial filter on the error surface can cause the edges of objects (or adjacent background) to appear slightly corrupted. (Thomas, col. 11, ll. 33-37)

Thomas also states:

> The output pictures were slightly soft, partially due to insufficient vertical detail being available in the input pictures (as only odd fields were used) and partly due to the simplistic spatial interpolator used when applying motion vectors with non-integer components. (Thomas, col. 11, ll. 17-22).

Thus, the Thomas reference discloses **a system that the Ziegler reference teaches to avoid**. Furthermore, modifying the Ziegler system with the teachings of the Thomas reference would not only depart from the original principle of operation of the Ziegler system, but it would also render the Ziegler system unsatisfactory for its original intended purpose, thereby negating, *as a matter of*

law, any motivation to modify the Ziegler reference in view of the Thomas reference to achieve the invention recited in Claim 6. (See MPEP §2143.01).

For the foregoing reasons, the combination of the Ziegler reference and the Thomas reference does not render Claim 6 or its dependent Claims 7-10 and 12 obvious under 35 U.S.C. §103(a), and it is respectfully submitted that Claims 6-10 and 12 are allowable over the Ziegler reference in view of the Thomas reference. Accordingly, reversal of this rejection is requested for at least the foregoing reasons.

B. Claim 11

Claim 11 stands rejected under 35 U.S.C. §103(a) as being unpatentable over the Ziegler reference and the Thomas reference in view of United States Patent No. 5,991,447 to Eifrig et al. ("the Eifrig reference").

In rejecting a claim under 35 U.S.C. § 103(a), the Examiner bears the initial burden of presenting a prima facie case of obviousness. In re Rijckaert, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish prima facie obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). In addition, generalized assertions that it would have been obvious to modify the reference teachings do not properly support a § 103 rejection. See In re Jones, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992). Furthermore, even if a claim concerns a "technologically simple concept," there still must be some finding as to the "specific understanding or principle within the

knowledge of a skilled artisan" that would motivate a person having no knowledge of the claimed subject matter to "make the combination in the manner claimed." In re Kotzab, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000).

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959); MPEP 2143.01.

Claim 11 depends from Claim 6. As discussed above, the Ziegler and the Thomas references do not disclose at least "determining a second motion vector with a sub-pel accuracy by an aliasing-reducing interpolation filtering," with "**more than four neighboring pixels** being utilized for an interpolation of each pixel." The Eifrig reference also fails to disclose or suggest this feature. Since the Ziegler, Thomas and Eifrig references do not disclose each and every feature of parent Claim 6, these references do not render dependent Claim 11 obvious under 35 U.S.C. §103(a).

Independent of the above, Applicants note that claim 11 is patentable over the applied references for the following additional reasons. According to the Examiner:

> [T]he combination of ZIEGLER and Thomas does not particularly disclose predicting video objects separately, and inserting coefficients into a transmission bit stream at a beginning.

> However, Eifrig et al teaches predicting video objects separately (Abs.), and inserting coefficients into a transmission bit stream (140) at a beginning in order to achieve efficient coding, object scalability, spatial and temporal scalability, and less error.
>
> Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing a method for generating an image when estimating a motion of image sequences as taught by ZIEGLER to incorporate the well known concept of predicting video objects separately, and inserting coefficients into a transmission bit stream at a beginning as taught be Eifrig et al in order to achieve efficient coding, object scalability, spatial and temporal scalability, and less error. (9/26/02 Office Action).

As described above in connection with claim 6 (from which claim 11 depends), the Thomas reference discloses a system that the Ziegler reference teaches to avoid. Additionally, modifying the Ziegler system with the Thomas reference would not only depart from the principle of operation of the Ziegler system, but it would render the Ziegler system unsatisfactory for its original intended purpose, thereby negating any motivation to combine the applied references, as a matter of law. MPEP 2143.01. Furthermore, while the Eifrig reference discloses a method and apparatus for coding digital video images, e.g., current image in a bi-directionally predicted video object plane, in particular where the current image and/or a reference image used to code the current image is interlaced coded, (Eifrig, col. 2, ll. 16-22), there is no apparent motivation to combine the Ziegler and Thomas references with the Eifrig reference, other than the teachings of the Applicants' disclosure. As noted above, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

Since there is no motivation to modify the Ziegler reference in view of the Thomas reference, much less a motivation to modify the two together in view of the Eifrig reference, a combination of these three references can not render

Claim 11 obvious under 35 U.S.C. §103(a). For these reasons, Applicants respectfully request that this rejection be reversed.

IX. CONCLUSION

For the foregoing reasons, it is respectfully submitted that the final rejection of claims 6-12 under § 103(a) should be reversed.

Respectfully submitted,

KENYON & KENYON

Dated: August 20, 2003

By: for Richard L. Mayer (by ___ R. No. 36,197)
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Date: August 20, 2003 Reg. No. 36,197

Signature: ____________
Jong H. Lee

APPENDIX TO APPELLANTS' APPEAL BRIEF
UNDER 37 C.F.R. § 1.192

S I R :

The claims involved in this appeal, claims 6-12, in their current form after entry of all amendments presented during the course of prosecution, are set forth below:

APPEALED CLAIMS:

6. A method for generating an image signal when estimating a motion of image sequences, motion vectors indicating, for each picture block of a current image, a position of the picture block used for a prediction with respect to a chronologically preceding reference image, the motion vectors being formed for each picture block, the method comprising the steps of:

in a first search step, determining a first motion vector with a pel accuracy;

starting out from the first motion vector, in a second search step, determining a second motion vector with a sub-pel accuracy by an aliasing-reducing interpolation filtering, using a digital filter, a resolution being selected to be higher than that corresponding to a resolution of a pixel raster in the first search step, more than four neighboring pixels being utilized for an interpolation of each pixel, to interpolate pixels between a scanning raster for the first search step; and

in a third search step, starting from the second motion vector, determining a third motion vector by a further interpolation filtering using the digital filter, a resolution being increased once more in comparison with the second search step, an interpolation being carried out on the basis of a pixel raster, with a resolution in the second search step.

7. The method according to claim 6, wherein the image signal is a prediction signal for video images generated using a motion-compensating prediction.

8. The method according to claim 6, wherein the more than four neighboring pixels are more neighboring pixels than are utilized for a bilinear interpolation.

9. The method according to claim 6, wherein, for the interpolation filtering in the second search step, an FIR filter is used having filter coefficients CO1 = 161/256, CO2 = -43/256, CO3 = 23/256, CO4 = -8/256.

10. The method according to claim 6, wherein for the further interpolation filtering in the third search step, an FIR filter is used having FIR filter coefficients CO1' = 1/2, CO2' = O, CO3' = O, CO4' = O.

11. The method according to claim 6, further comprising the steps of:

in order to predict video objects, separately conditioning, for each video object, filter coefficients of the digital filter; and

inserting the filter coefficients into a transmission bit stream at a beginning of transmission of an object in question.

12. The method according to claim 6, further comprising the step of:

adapting, for an encoding of a motion vector for a transmission, a range of values of motion vector differences to be coded to an increased resolution.

Respectfully submitted,

KENYON & KENYON

Dated: August 20, 2003

By: for Richard L. Mayer (by [illegible] R. No. 26,197)
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